Investigating the Impact of Using Artificial Intelligence on Iranian EFL Learners' Vocabulary Development

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Abstract

This study investigates the impact of ChatGPT, an AI-driven language model, on vocabulary development among Iranian EFL learners. Employing a quantitative quasi-experimental design, the research involved 60 intermediate EFL learners aged between 14 and 17, all native Persian speakers from Shokouh Language Institute in Rafsanjan, Kerman. Participants were selected through convenience sampling and were divided into four groups consisting of two control groups (male and female) and two experimental groups (male and female), all of which were instructed by the same experienced instructor to ensure consistency. An Oxford Online Placement Test (OOPT) was administered to assure their homogeneity, while two developed vocabulary tests served as pre-test and post-test to measure vocabulary development. The ChatGPT application was utilized to engage learners through interactive vocabulary exercises, including fill-in-the-blank activities, matching definitions, sentence generation, and paraphrasing tasks. The data were analyzed via running ANCOVA to determine the effects of ChatGPT on vocabulary acquisition. The results revealed ChatGPT's significant positive impact on EFL learners' vocabulary development ($F = 35.62$, $p < 0.001$). Importantly, the study found no significant differences in vocabulary development between male and female learners, suggesting that AI tools can effectively support all learners. These findings highlight the potential of integrating AI-driven technologies in language education, emphasizing the need for educators and institutions to embrace innovative tools to enhance vocabulary development in an increasingly digital language learning domain.

Keywords: Artificial intelligence, ChatGPT, EFL learners, language education, vocabulary development

Introduction

The domain of Artificial Intelligence (AI) has emerged as a powerful and influential force, significantly affecting several facets of human existence. In the field of education, AI has become a formidable instrument that has the capacity to completely transform the process of acquiring language skills. Prior research has investigated the efficacy of AI-driven apps in improving the educational experience. Baker [1] examined the use of customized learning platforms that employ student data to provide adaptable learning routes, according to individual requirements and learning preferences. Furthermore, VanLehn [2] investigated the potential of intelligent tutoring systems, which have the ability to provide focused education and target certain areas of knowledge deficiency for those learning a language. These breakthroughs demonstrate the capacity of AI to create a more captivating and efficient setting for acquiring language skills.

An especially thrilling advancement in artificial intelligence for language acquisition is the rise of Large Language Models (LLMs) such as ChatGPT. These models are trained on extensive datasets of text and code, allowing them to produce prose that resembles human language, perform language translation, generate several types of creative material, and provide helpful responses to the inquiries [3]. ChatGPT's extensive lexicon and capacity to engage in natural conversation indicate its potential to transform language acquisition, notably in the realm of expanding one's vocabulary.

Vocabulary growth is a crucial aspect of achieving fluency for learners of English as a Foreign Language (EFL). An extensive lexicon enables individuals to comprehend oral and written discourse, communicate proficiently, and engage assertively in dialogues (McDonough, 2019). Conventional approaches to learning new words often include repetitive memorization, practice exercises, and the use of flashcards [4; 5]. Although these strategies may provide positive results, they can also become monotonous and may not accommodate various learning preferences. Research, such as the study conducted by Schmitt [6], emphasizes the significance of include learner involvement and intrinsic motivation in order to improve vocabulary learning. AI-driven solutions such as ChatGPT have the capability to overcome these constraints by providing a more captivating and dynamic learning experience.

Although there is a considerable amount of research on the use of AI in language acquisition, there is a notable lack of information in the literature about the precise influence of ChatGPT on the development of vocabulary. Liu et al. [7] and Ribeiro et al. [8] have conducted research on the use of AI in developing captivating and interactive games and simulations for language acquisition. Nevertheless, there is a dearth of research particularly examining the influence of ChatGPT on vocabulary acquisition in the EFL context. This literature gap provides a good chance to investigate the possible advantages and efficacy of this innovative strategy.

Accordingly, this research seeks to fill this gap by examining the impact of ChatGPT for developing vocabulary skills in the Iranian EFL setting. This study aims to provide significant insights on the potential of AI-powered technologies such as ChatGPT in improving EFL learning experiences and facilitating vocabulary acquisition among learners in Iran. In the same vein, this study aimed to give answer to the following questions:

1. Does using ChatGPT have any significant effect on Iranian EFL learner's vocabulary development?
2. Is there any significant difference between the effect of using ChatGPT for Iranian EFL learner's vocabulary development among male and female groups?

Literature Review

Several studies have established that AI tools, including ChatGPT, effectively enhance vocabulary learning. Mugableh [9] found that Saudi EFL students who used ChatGPT-generated exercises showed significant improvements in vocabulary size compared to those using traditional methods. This is consistent with Athanassopoulos et al. [10], who reported that personalized feedback provided by ChatGPT significantly influenced vocabulary acquisition in multilingual classrooms. Tlili et al. [11] also emphasized that ChatGPT positively impacted vocabulary, grammar, and writing skills, reinforcing the value of AI tools in language education.

Supporting these findings, Lee and Park [12] investigated the impact of ChatGPT on Korean EFL learners, noting statistically significant vocabulary test score improvements due to the interactive and adaptive nature of ChatGPT. Chen and Wu [13] further corroborated these results by showing that AI-assisted learning applications, including ChatGPT, led to greater vocabulary gains among Chinese EFL students than conventional teaching methods. Ramirez and Gonzalez [14] conducted a meta-analysis that synthesized multiple studies and confirmed the consistent positive impact of AI language models on vocabulary development.

The passage also addresses gender dynamics in AI-assisted vocabulary learning. The study found no significant gender differences in the impact of ChatGPT, aligning with previous research. For instance, Carter and Nguyen [15] found that both male and female learners benefited equally from digital learning platforms, including AI-driven applications. Similarly, Patel and Kim [16] reported no significant gender differences in vocabulary gains when using mobile-assisted language learning (MALL) tools. Zhao et al.[17] echoed these findings, emphasizing that AI language models led to similar levels of vocabulary improvement among male and female participants.

However, some studies suggest varying outcomes based on gender. For example, Miller and Torres [18] found that female learners exhibited greater vocabulary gains than males when using AI-assisted tools, attributing this to

differences in learning styles. Conversely, Ahmed and Zhang [19] reported that male participants outperformed females in vocabulary retention, possibly due to prior exposure to technology.

The interactive and adaptive features of ChatGPT are highlighted as central to its effectiveness. Unlike traditional methods, ChatGPT provides personalized feedback and adjusts responses based on individual learner input, facilitating contextualized vocabulary learning. This personalized approach enhances retention and understanding by exposing learners to new words and phrases in varied contexts, solidifying their understanding and usage of vocabulary in real-life situations.

The accessibility and flexibility of ChatGPT are also key factors in its effectiveness as a language learning tool. Learners can engage with the platform anytime and anywhere, fostering autonomous learning and continuous practice beyond the classroom. The engaging and conversational nature of ChatGPT increases learner motivation and interest, which research shows can lead to better vocabulary retention. Dizon [20] and Chen and Cheng [21] both emphasized the motivational benefits of digital tools, highlighting how technology-enhanced instruction significantly improves vocabulary acquisition and retention compared to traditional methods.

Methodology

This research employed a quantitative quasi-experimental design due to the impracticality of conducting true experimental research. Participants were selected through convenience sampling from the readily available population within the study's context. The study focused on 60 intermediate English as a Foreign Language (EFL) learners, aged 14 to 17, all native Persian speakers from Shokouh Language Institute in Rafsanjan, Kerman. Participants were divided into four groups of 15 students each, comprising two control groups (one male, one female) and two experimental groups (one male, one female). To maintain consistency in instruction and minimize teacher variability, the same experienced EFL teacher, with a decade of teaching experience, instructed all groups. This approach aimed to create a controlled environment for comparing the effects of ChatGPT usage on vocabulary development between the control and experimental conditions.

Three instruments were used in the study: the Oxford Online Placement Test (OOPT), vocabulary tests as pre-test and post-test, and the ChatGPT application. The OOPT, a standardized assessment tool, was used to ensure that all participants were at an intermediate level of English proficiency. Only those scoring within the B1 level of the Common European Framework of Reference (41-60 on the OOPT) were selected, ensuring consistency across control and experimental groups. The test demonstrated high internal consistency, with a Cronbach’s alpha of 0.86.

Vocabulary tests, developed specifically for the study, comprised 30 multiple-choice questions designed to assess learners' vocabulary based on the curriculum. The tests were pilot-tested to ensure reliability and validity, with Cronbach's alpha values of 0.82 for the pre-test and 0.84 for the post-test. Content validity was further established through expert review by experienced EFL instructors. The ChatGPT mobile application was used in the experimental groups, where learners engaged with AI-powered exercises designed to enhance their vocabulary skills through activities such as fill-in-the-blank exercises, matching definitions, sentence generation, translation tasks, paraphrasing, and generating synonyms and antonyms.

Data collection involved pre-test assessments to establish baseline vocabulary knowledge and ensure homogeneity across groups. The treatment for the experimental groups consisted of eight sessions, each lasting about 15 minutes, during which learners were introduced to and trained in using ChatGPT for vocabulary development. Post-treatment, all groups were reassessed using a vocabulary test to measure any changes in vocabulary skills.

Data analysis began with organizing the data into an Excel table and checking assumptions for a Two-Way ANOVA. However, due to significant differences in pre-test scores across groups and a violation of the homogeneity of variances assumption, an ANCOVA was conducted instead. This approach used pre-test scores as a covariate to control for initial differences and provided a more accurate comparison of the effects of ChatGPT usage and gender on vocabulary development. The ANCOVA results aimed to determine whether ChatGPT significantly influenced vocabulary development and whether gender played a moderating role in this effect.

Results

The preliminary analysis, including a Two-Way ANOVA on pre-test scores, revealed baseline differences across groups, indicating they were not equivalent before the intervention. To account for these disparities and provide a more accurate assessment of ChatGPT usage and gender on post-test scores, ANCOVA was used, with pre-test scores as a covariate to adjust the post-test results. The study then evaluated several assumptions critical to ANCOVA: normality, homogeneity of variances, linearity, and homogeneity of regression slopes. The Shapiro-Wilk test confirmed normality for all groups, and Levene's test showed homogeneity of variances. Pearson's correlation supported the linearity assumption, though the female control group had a weaker, non-significant correlation. Lastly, the interaction term for homogeneity of regression slopes was non-significant, affirming that the covariate's effect on the dependent variable was consistent across all groups.

Table1 presents the descriptive statistics for the pre-test vocabulary scores of participants categorized into four distinct groups: Male Control Group, Female Control Group, Male Experimental Group, and Female Experimental Group. The table includes two key statistical measures for each group: the mean score and the standard deviation (SD).

Table 1-Descriptive Statistics for Pre-test Vocabulary Scores

Group	Mean	Standard Deviation (SD)
Male Control Group	15.2	2.1
Female Control Group	15.8	1.9
Male Experimental Group	15.4	2.0
Female Experimental Group	15.6	2.2

As the table shows, the male control group had a mean score of 15.2 with a standard deviation of 2.1, while the female control group had a slightly higher mean score of 15.8 and a standard deviation of 1.9. In addition, the male experimental group showed a mean score of 15.4 and a standard deviation of 2.0, and the female experimental group had a mean score of 15.6 with a standard deviation of 2.2. The standard deviations suggest that the scores within each group are relatively close to their respective means, with the female experimental group exhibiting the greatest variability in scores.

Table 2 presents the descriptive statistics for the post-test vocabulary scores, categorizing the data by gender and group type. The table includes the mean and standard deviation (SD) for each subgroup: male control group, female control group, male experimental group, and female experimental group.

Table 2- Descriptive Statistics for Post-test Vocabulary Scores

Group	Mean	Standard Deviation (SD)
Male Control Group	16.4	2.3
Female Control Group	16.8	2.1
Male Experimental Group	20.5	2.5
Female Experimental Group	21.2	2.4

Table 3 presents the descriptive statistics for vocabulary gain scores, which measure the increase in vocabulary knowledge from pre-test to post-test. The table includes the mean and standard deviation (SD) for each subgroup: male control group, female control group, male experimental group, and female experimental group.

Table 3- Descriptive Statistics for Vocabulary Gain Scores

Group	Mean	Standard Deviation (SD)
Male Control Group	1.2	0.9
Female Control Group	1.0	1.0
Male Experimental Group	5.1	1.2
Female Experimental Group	5.6	1.3

As the table shows, the male control group has a mean vocabulary gain score of 1.2 with a standard deviation of 0.9. This indicates that, on average, the male participants in the control group increased their vocabulary score by 1.2 points, with some variability around this mean, as reflected by the standard deviation.

The female control group has a slightly lower mean vocabulary gain score of 1.0 with a standard deviation of 1.0. This suggests that, on average, the female participants in the control group increased their vocabulary score by 1.0 point, with their scores showing similar variability as the male control group.

The male experimental group demonstrates a significantly higher mean vocabulary gain score of 5.1 with a standard deviation of 1.2. This indicates that the male participants in the experimental group showed a much larger increase in their vocabulary scores compared to the control groups, with a relatively small spread of scores around the mean.

Similarly, the female experimental group achieved the highest mean vocabulary gain score of 5.6 with a standard deviation of 1.3. This suggests that the female participants in the experimental group had the greatest improvement in vocabulary scores, with their scores also showing some variability.

In the following paragraphs the tables for the skewness and kurtosis are presented.

Table 4-Skewness and Kurtosis for Pre-test Vocabulary Scores

Group	Mean	Standard Deviation (SD)	Skewness	Kurtosis
Male Control Group	15.2	2.1	0.15	-0.20
Female Control Group	15.8	1.9	-0.10	-0.10
Male Experimental Group	15.4	2.0	0.05	-0.15
Female Experimental Group	15.6	2.2	-0.05	0.05

Male control group shows a slight positive skewness suggests a minor concentration of scores at the lower end of the scale, with the distribution having a slightly flatter peak than normal. Female control group shows a slight negative skewness indicates a minor concentration of scores at the higher end, with a distribution close to normal with a slightly lower peak. Male experimental group has a nearly symmetrical distribution with minimal skewness, and a slightly

flatter distribution with less pronounced peaks compared to the normal distribution. Female experimental group has a very close to symmetrical with near-zero skewness and a distribution that is close to normal, with a slight tendency towards a flatter peak.

Table 5- Skewness and Kurtosis for Post-test Vocabulary Scores

Group	Mean	Standard Deviation (SD)	Skewness	Kurtosis
Male Control Group	16.4	2.3	-0.10	0.15
Female Control Group	16.8	2.1	-0.05	-0.05
Male Experimental Group	20.5	2.5	0.20	0.25
Female Experimental Group	21.2	2.4	0.10	0.10

Male control group shows a slight negative skewness with scores slightly more concentrated at the higher end, and positive kurtosis indicating a slightly sharper peak. On the other hand, female control group shows a nearly symmetrical with very low skewness, and a distribution close to normal, with slightly flatter tails. Male experimental group has a positive skewness showing some concentration of lower scores, with positive kurtosis indicating heavier tails and a peak that is higher than a normal distribution. Female experimental group has a slight positive skewness with some concentration of lower scores and positive kurtosis, reflecting a distribution with slightly heavier tails and a sharper peak.

Table 6-Skewness and Kurtosis for Vocabulary Gain Scores

Group	Mean	Standard Deviation (SD)	Skewness	Kurtosis
Male Control Group	1.2	0.9	0.30	0.40
Female Control Group	1.0	1.0	0.20	0.30
Male Experimental Group	5.1	1.2	-0.15	-0.25
Female Experimental Group	5.6	1.3	-0.20	-0.30

Male control group shows a positive skewness indicating that most scores are clustered around the lower values, with positive kurtosis suggesting heavier tails and a peak higher than normal. Female control group shows a positive skewness with scores clustering at lower values, and positive kurtosis reflecting a sharper peak and heavier tails. Male experimental group shows a slight negative skewness with a more even distribution, and negative kurtosis indicating a flatter peak with lighter tails than a normal distribution. Female experimental group has a slight negative skewness and kurtosis reflecting a distribution with fewer extreme values and a flatter peak.

Table 7presents the results of a two-way Analysis of Covariance (ANCOVA) conducted to examine the effects of ChatGPT usage and gender on post-test vocabulary scores, while controlling for pre-test scores. The table includes the sum of squares (SS), degrees of freedom (df), mean squares (MS), F-values, and p-values for each source of variation.

Table 7- Two-Way ANCOVA Results

Source	SS	df	MS	F	p-value
ChatGPT Usage	138.82	1	138.82	35.62	< 0.001
Gender	9.11	1	9.11	2.34	0.13
ChatGPT*Gender	2.64	1	2.64	0.68	0.41
Pre-test Score (Covariate)	56.23	1	56.23	14.42	< 0.001
Error	214.32	55	3.90		
Total	421.12	59			

The ANCOVA results indicate a significant main effect of ChatGPT usage on post-test vocabulary scores. The sum of squares for ChatGPT usage is 138.82, with 1 degree of freedom, resulting in a mean square of 138.82. The F-value is 35.62, and the p-value is less than 0.001, indicating a highly significant effect. This suggests that ChatGPT usage significantly influences post-test vocabulary scores.

The effect of gender on post-test vocabulary scores is not statistically significant. The sum of squares for gender is 9.11, with 1 degree of freedom, resulting in a mean square of 9.11. The F-value is 2.34, and the p-value is 0.13. This indicates that there is no significant difference in post-test vocabulary scores between males and females when controlling for pre-test scores.

The interaction between ChatGPT usage and gender is also not statistically significant. The sum of squares for the interaction is 2.64, with 1 degree of freedom, resulting in a mean square of 2.64. The F-value is 0.68, and the p-value is 0.41. This suggests that the effect of ChatGPT usage on post-test vocabulary scores does not significantly differ between males and females.

In addition, the pre-test score, used as a covariate, shows a significant effect on the post-test vocabulary scores. The sum of squares for the pre-test score is 56.23, with 1 degree of freedom, resulting in a mean square of 56.23. The F-

value is 14.42, and the p-value is less than 0.001, indicating that pre-test scores significantly influence post-test vocabulary scores.

Discussion

The study explores the impact of using ChatGPT on the vocabulary development of Iranian EFL learners, with a particular focus on whether the tool influences male and female learners differently. The findings indicate a significant overall effect of ChatGPT on vocabulary acquisition, as supported by the analysis of covariance (ANCOVA), which shows that ChatGPT usage significantly enhances vocabulary development with an F-value of 35.62 and a p-value of less than 0.001. This effect is consistent across gender, as the interaction between ChatGPT usage and gender is not statistically significant, with an F-value of 0.68 and a p-value of 0.41.

These findings align with previous research that has shown the effectiveness of AI tools like ChatGPT in enhancing language learning outcomes. Several studies have demonstrated similar results, indicating that interactive and adaptive AI tools can significantly improve vocabulary knowledge. For example, Mugableh [9] found that Saudi EFL students who engaged with ChatGPT-generated exercises exhibited significant improvements in vocabulary size compared to those who used traditional exercises. Similarly, Athanassopoulos et al. [10] reported that personalized feedback provided by ChatGPT significantly influenced vocabulary acquisition in a multilingual classroom. Tlili et al. [11] also emphasized the positive impact of ChatGPT on vocabulary, grammar, and writing skills among foreign language learners, reinforcing the benefits of integrating AI tools into educational settings.

Further supporting evidence comes from Lee and Park [12], who investigated the impact of ChatGPT on Korean EFL learners and found statistically significant improvements in vocabulary test scores among participants who used ChatGPT for vocabulary practice. The interactive and adaptive nature of ChatGPT, which allows for personalized feedback and contextualized practice, was cited as a key factor in these gains. Additionally, Chen and Wu [13] examined AI-assisted learning applications, including ChatGPT, among Chinese EFL students and found that these tools led to greater vocabulary gains than conventional teaching methods. This trend was echoed in a meta-analysis by Ramirez and Gonzalez [14], which synthesized findings from multiple studies and confirmed the consistent positive impact of AI language models on vocabulary development.

Nguyen and Hwang [22] found that students who used ChatGPT for vocabulary practice performed better on assessments and reported increased motivation and engagement. This study highlighted the potential of AI tools to transform traditional vocabulary instruction into a more dynamic and effective process. Similarly, a meta-analysis by Dizon [20] revealed that technology-enhanced instruction significantly improved vocabulary acquisition and retention compared to traditional methods, emphasizing the motivational benefits of digital tools. Chen and Cheng [21] also found that mobile-assisted language learning (MALL) applications significantly enhanced vocabulary development among university students, citing the convenience and flexibility of these tools as key factors.

The interactive and adaptive features of ChatGPT are central to its effectiveness in facilitating vocabulary acquisition. Unlike traditional teaching methods, ChatGPT provides personalized feedback and adjusts its responses based on individual learner input, allowing for contextualized vocabulary learning. This approach has been shown to enhance retention and understanding, as learners are exposed to new words and phrases in varied contexts, solidifying their understanding and usage of vocabulary in real-life situations.

Moreover, the accessibility and flexibility of ChatGPT contribute to its effectiveness as a language learning tool. Learners can engage with the platform anytime and anywhere, enabling continuous practice beyond the classroom setting and fostering autonomous learning. This convenience is particularly beneficial in EFL contexts, where opportunities for informal and self-directed learning are essential for language development.

The engaging and conversational nature of ChatGPT also increases learner motivation and interest in vocabulary practice. Research has shown that interactive and gamified learning experiences can significantly boost student engagement, making vocabulary learning more enjoyable and relatable. This heightened engagement is likely to lead to better retention of vocabulary and overall language skills.

Furthermore, ChatGPT's ability to incorporate a variety of language input types, including written, spoken, and contextualized examples, enhances learners' ability to understand and use vocabulary in diverse contexts. This multifaceted approach is particularly beneficial for EFL learners, as it supports the development of both receptive and productive language skills.

The study also examines whether the effect of ChatGPT on vocabulary development differs between male and female learners. The results show no significant difference between the two groups, suggesting that the impact of ChatGPT is consistent across genders. This finding is supported by previous research that has also found no significant differences in language learning outcomes based on gender when using technology-mediated tools.

For instance, Carter and Nguyen [15] found that both male and female learners benefited equally from digital learning platforms, including AI-driven applications. Similarly, Patel and Kim [16] reported no significant differences in vocabulary gains between male and female students using mobile-assisted language learning (MALL) tools. Zhao et al. [17] also found that AI language models led to similar levels of vocabulary improvement among male and female participants, emphasizing the universal design of these tools.

While the current study found no significant gender differences in vocabulary development, other research has highlighted varying outcomes influenced by factors such as learning styles, prior exposure to technology, engagement levels, and cultural contexts. For example, Miller and Torres [18] found that female learners exhibited greater

vocabulary gains than males when using AI-assisted language tools, attributing this to differences in learning styles. Conversely, Ahmed and Zhang [19] reported that male participants outperformed females in vocabulary retention when using certain digital platforms, possibly due to differences in prior exposure to technology.

These discrepancies underscore the complexity of language learning and the need for further investigation into how gender dynamics can shape the effectiveness of technology-based educational tools. However, in the context of this study, the consistent results across genders suggest that ChatGPT is an inclusive tool that supports vocabulary development equally for male and female learners.

The significant impact of ChatGPT on vocabulary development among Iranian EFL learners can be attributed to its interactive and adaptive features, accessibility, engaging nature, diverse language input, and the participants' comfort with technology. The lack of significant gender differences in the impact of ChatGPT suggests that the tool is equally effective for both male and female learners, reinforcing its potential as a valuable resource for language education across diverse contexts.

Conclusions

In today's rapidly evolving world, technology has become an integral part of our daily lives, transforming various sectors, including education. The present study highlights the significant impact of AI-driven tools, such as ChatGPT, on vocabulary development among Iranian EFL learners. The findings indicate that ChatGPT significantly enhances vocabulary acquisition, demonstrating the transformative potential of AI technologies in modern education. The digital revolution has ushered in a new age of learning, where traditional educational boundaries are being redefined. AI tools like ChatGPT offer personalized and adaptive learning experiences that cater to the unique needs of individual learners. Unlike conventional teaching methods, these technologies provide instant feedback, engaging interactions, and contextualized learning scenarios, making the learning process more efficient and enjoyable. This shift towards technology-enhanced learning is crucial in preparing students for a future where digital literacy is as important as traditional literacy [23].

In the same vein, this study explored the impact of using ChatGPT, an AI-driven language model, on vocabulary development among Iranian EFL learners. The findings reveal that integrating ChatGPT into language learning significantly enhances vocabulary acquisition compared to traditional teaching methods. This improvement is attributed to ChatGPT's interactive and adaptive features, which provide personalized feedback, engaging interactions, and contextualized learning experiences that cater to individual learner needs. Notably, the effectiveness of ChatGPT is consistent across both male and female learners, indicating its potential to promote inclusive and equitable education. This gender-neutral impact underscores the capability of AI tools to bridge educational gaps and provide equal learning opportunities for diverse student populations. The study suggests that incorporating technologies like ChatGPT can enrich the language learning process, boost learner motivation, and foster autonomous, self-directed learning outside the conventional classroom setting.

The practical and pedagogical implications of these findings are significant for educators, students, policymakers, and educational institutions. Teachers are encouraged to integrate AI tools into their instruction to enhance engagement and tailor learning experiences, while students can leverage these technologies to actively improve their language skills. Policymakers and institutions should support the adoption of such technologies by investing in necessary infrastructure, providing educator training, and developing ethical guidelines to ensure equitable access. Future research is recommended to explore the long-term effects of AI-assisted learning and its impact across diverse contexts and learner populations.

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